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Combat Crew

strategic air command

SEPTEMBER 1987

★★★★



UNITED STATES AIR FORCE



SEPTEMBER 18, 1947

The Conventional Challenge



Lt General James P. McCarthy
Commander, Eighth Air Force

In recent years, it has become painfully obvious that the United States requires increased conventional capability to secure its global interests. The nation is confronted by serious threats to those interests in regional Soviet conventional superiority, well armed third world adversaries, and state sponsored terrorism. Furthermore, any agreement to eliminate theater nuclear missiles will force even greater reliance on conventional power to maintain peace and prevent coercion.

In this dangerous world situation, SAC's long range bomber force holds the promise of significantly improving America's ability to secure its global interests. The B-52 can rapidly deliver large, varied payloads over great distances, at night and in weather. That means our B-52 force has tremendous conventional potential. Our challenge is to fully exploit that potential to provide a credible combat capability to buttress our nation's defenses.

We've embarked on an extensive program to do just that. SAC Headquarters is pursuing near-term enhancements to the B-52 (including standoff munitions) that will make it a full capable conventional bomber. As B-52s are replaced in the SIOP by more modern bombers, we plan to retain them in a dedicated conventional force.

Additionally, we've developed the Strategic Area of Responsibility (SAR) concept to effectively employ that force in a theater conflict. That concept capitalizes on bomber strengths to attack deep targets crucial to the enemy war effort.

At the operational level, we're aggressively developing the capability of our bomb wings to conduct warwinning conventional operations. Those operations differ markedly from our traditional nuclear role. They require unique skills and a different mindset of those people who operate, maintain, and support the bomber force. Units must be able to deploy overseas with the necessary people and equipment to sustain combat operations from austere forward operating locations (FOL) that aren't well suited for bomber operations. And, they must do so semi-autonomously with little headquarters guidance. As for the aircrews, they must be able to fly off short, narrow runways; penetrate enemy territory at night; avoid a variety of defenses; put weapons on target; and recover at the FOL.

We're stressing realistic training to sharpen the skills required to succeed in these operations. SAC Headquarters recently implemented the RAPID SHOT program to exercise unit capabilities for short-notice deployments to forward Air Force installations. During the deployment, units maximize conventional training activities.

Eighth Air Force is building upon that initiative with realistic training under anticipated wartime conditions. Our bomb wings are using European-style airfields in the CONUS for B-52 operations. Flying out of installations such as Volk Field, Wisconsin, will prepare our units and aircrews for the demanding conditions they will likely encounter in the European theater—short and narrow runways, limited ramp space, narrow taxiways and few support facilities.

Under operation MIGHTY FORCE, our units are deploying to relatively austere airfields in the CONUS (such as Clinton-Sherman, Oklahoma) to participate in RED FLAG core exercises under simulated wartime conditions. The wing commander and his staff must effectively manage the resources on hand to sustain a high sortie rate with minimal outside assistance. Unit support elements gain invaluable experi-

ence in performing those functions necessary for effective bomber operations at an FOL during wartime—munitions handling, fuels support, aircraft maintenance, field feeding, airfield operations, resource protection, communications support, etc. And, we're learning important lessons about what it takes for successful deployed bomber operations in wartime.

The next logical step in developing a credible conventional combat capability is to deploy wings to actual FOLs in foreign countries to conduct semi-autonomous bomber operations as part of a combined exercise. We expect to do just that in the very near future.

As for our bomber crews, flying in a conventional conflict will severely challenge their airmanship skills. Conventional missions differ significantly from the standard SIOP mission profile. Therefore, we're emphasizing the fundamentals in aircrew training to ensure the basic operation of the aircraft is second nature in the demanding combat environment. There's little room for error when you're landing on a 9000 x 150 foot runway or flying several hundred feet off the deck at night. Plus, we're having aircrews gradually perform more demanding flight operations to continue to move them further up the proficiency curve. In particular, we're exposing aircrews to more of the B-52's operational envelope, so they can confidently exploit the full capability of the airframe in combat.

Moreover, we're increasing the frequency and realism of conventional training to better prepare crews for combat operations. That means more night, low level flying; live and inert conventional releases; terrain masking; comm out operations; multi-threat avoidance; fighter interceptor exercises; and realistic target area tactics.

Well trained units combined with a full capable conventional bomber force will provide the credible conventional combat capability the nation requires. In the final analysis, the success of SAC's conventional program depends upon the hard work and dedication of all bomb wing members. We need a dedicated team effort to transform SAC's conventional potential into tangible warfighting capability. We must succeed—for the sake of the nation and the preservation of peace and freedom for future generations of Americans.★★★

Combat Crew

Magazine of the Strategic Air Command — 37th Year of Publication

GEN JOHN T. CHAIN JR.
COMMANDER IN CHIEF, SAC

BRIG GEN EUGENE E. HABIGER
INSPECTOR GENERAL

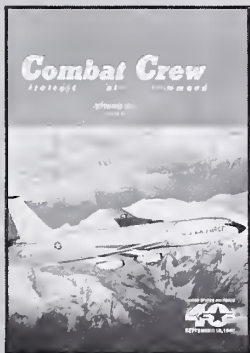
COL CHARLES J. WINGERT
DIRECTOR OF SAFETY

EDITOR
MAJ JIM KRISTL

ASSOCIATE EDITOR
KEN MAASSEN

ART EDITOR
W. A. KIRKPATRICK

EDITORIAL ASSISTANT
M. J. ABBODD



ON OUR COVER

The KC-135-A on the cover represents one of the safest weapons systems in the command and serves as a reminder of how far we've come in 40 years. (See page 4).

SACRP 127-1 VOL. XXXVII NO. 9 SEPTEMBER 1987

COMBAT CREW is an internal publication of the Strategic Air Command with the primary purpose of promoting safety. The contents of this magazine are informative and not to be considered as directive in nature. Facts, testimony and conclusions of all mishaps herein may not be construed as incrimination under Article 31 of the Uniform Code of Military Justice. All names, dates and places used in conjunction with mishap stories are fictitious. Written permission must be obtained from Headquarters, Strategic Air Command before any material may be reprinted by other than U.S. Air Force organizations. Use of funds for printing this publication has been approved by Hq. USAF, Distribution FX, controlled by IGFE, SAC units submit distribution requests through local PDO. Reader to copy ratio one per combat crew; 10:1 for other SAC personnel. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Contributions are encouraged as well as comments and criticism. Direct correspondence with the Editor is authorized. Address correspondence to Editor, Combat Crew, HQ SAC/IGFE Offutt AFB, NE 68113-5001 AV 271-2620/6221.

SEPTEMBER 1987

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UNITED STATES AIR FORCE

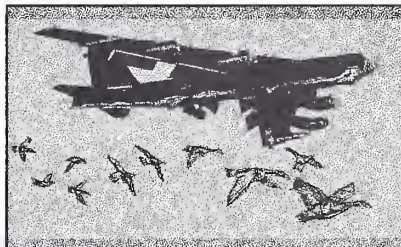


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UNITED STATES AIR FORCE



SEPTEMBER 18, 1947

40 Years Of Safety Commitment

As we celebrate the 40th anniversary of the establishment of the Air Force it is time to reflect how far we've come in terms of mishap prevention and discuss how we got there. SAC's aircraft mishap rate in 1946 was 75.48 for every 100,000 flying hours. No that's not a misprint. The Air Force itself was laboring under an astronomical rate of 44 for every 100,000 hours in 1947.

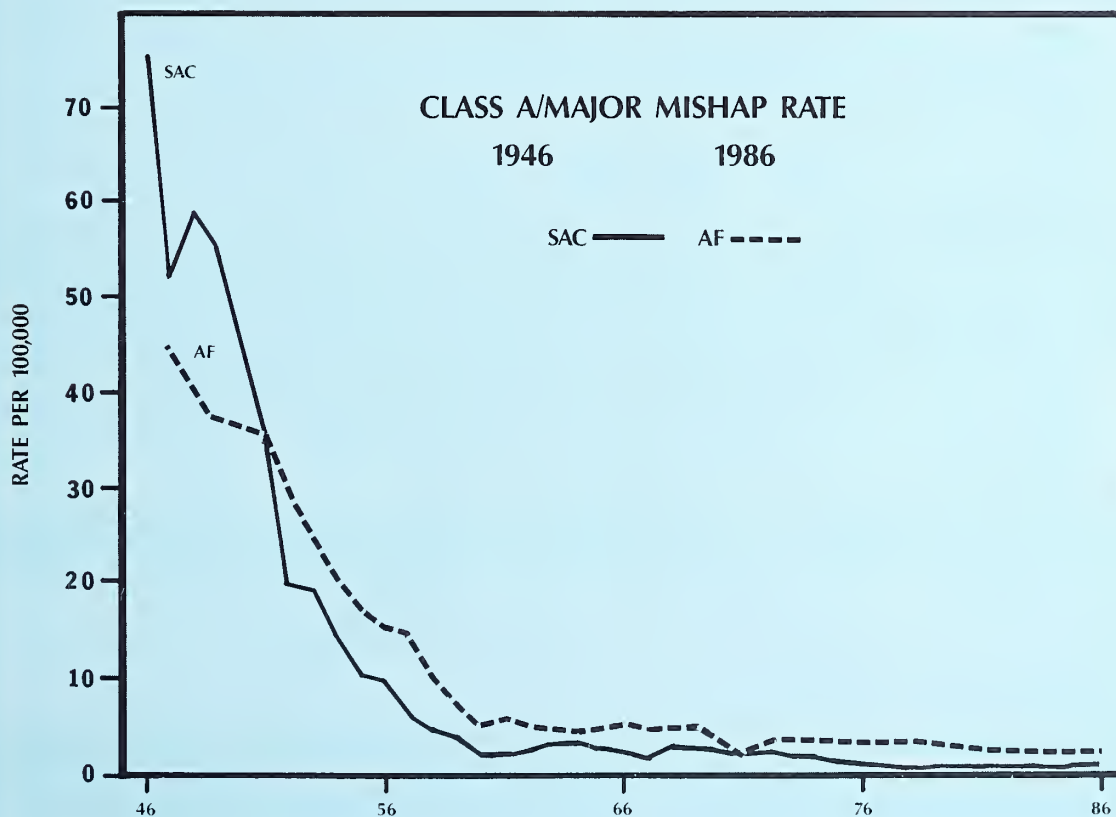
These rates could not continue very long before the effects would become paralyzing. We were losing more than four aircraft per month! These rates threatened to drain irreplaceable manpower and weapons systems if allowed to continue.

General Curtis LeMay set out to correct this situation. First he pulled in one of his top commanders and directed a command-wide flying safety program be set up with



SAC tankers, transports, fighters and bombers (including an early model B-52) arrayed on the tarmac. This photo recalls the years when SAC's commitment to lowering the mishap rate was just beginning.

emphasis on supervision and technical data. Second, he established *Combat Crew* magazine to educate personnel with special emphasis on crew members and maintenance personnel. One of the initial goals of the new program was to have one accident free month. General LeMay recognized early that supervision and accurate technical data were essential to the creation of a safe environment. Eventually, however, it all boils down to crew members and maintenance personnel. The result of your efforts has brought the SAC mishap rate to 0.29 per 100,000 hours in 1986. The Air Force rate has dropped to 1.79 per 100,000 hours in 1986. Your self-discipline and commitment to safe operations have been proven crucial to mission capability—after all, that is the real bottom line, mission capability. Fly smart. Fly safe.



R&M 2000

Performance on Demand

Maj Gen Richard B. Goetze, Jr.
SAC Deputy Chief of Staff, Plans

"SAC has declared war on systems that are unreliable and unmain-
tainable!" With these words, Vice CINCSAC Lt Gen Peek set the course for meeting SAC's reliability and maintainability (R&M) objectives established by CINCSAC Gen Chain when he stated, "Combat capability on the ground doesn't do me any good if I can't get it in the air—each time, every time."

General Chain's words embrace the tenets of the Air Force's R&M 2000 program, established in February 1985. R&M 2000 set forth to improve the reliability and maintainability of systems with these five goals in mind:

- Increase combat capability.
- Increase survivability of the combat support structure.
- Decrease mobility requirements per unit.
- Decrease manpower requirements per unit.
- Decrease life cycle cost.

The five goals are in priority order with increased combat capability most important, and believe it or not, decreased life cycle cost least important. That doesn't say cost is not important, it says combat capability is most important. All five goals work together toward the common goal of increased readiness. In other words, improved reliability means your system is ready to perform on demand—result: increased combat capability. Additionally, improved reliability reduces the size of the combat support structure (intermediate level maintenance, LOX plants, support equipment, WRSK kits, etc.), increasing survivability. Also,

because line replaceable units last longer, fewer spares are needed, thus reducing mobility requirements, and less manpower is required to maintain the system. And last, if all the above goals are met, the cost of ownership will be less. As you can see, these goals interact, with the net benefit being increased readiness.

Basically the objective of R&M 2000 is to stress the need for systems that rarely break, and when they do break, are easily and quickly repaired. SAC is aggressively working to improve the R&M of our weapon systems by assuring R&M is considered in the design phase of our new systems and determining where R&M improvements can be made to fielded systems.

Why is R&M 2000 any different from past "management improvements?" Because R&M 2000 demands a new way of doing business. R&M 2000 demands the aerospace industry design systems right the first time, simplifying their operation and maintenance. R&M 2000 has the Air Force senior level support necessary to insure success. The Air Force is realizing improved R&M is a "force multiplier"—having weapon systems that rarely break is equivalent to having more weapon systems. Additionally, with the savings improved R&M can generate (through reduced manpower, spares, support equipment), we can buy more weapon systems. This makes R&M a "smart" investment.

Where do you fit into R&M 2000 and SAC's R&M program? People in the field are the foundation on which the success of SAC's R&M program rests. You are a vital element not only because

you operate and maintain our systems on a day-to-day basis, but you possess a vast store of expert knowledge. People in the field see R&M problems firsthand and often have superb suggestions to fix these problems. There can't be an R&M program without ideas from you—the users!

To tap this pool, a network of unit R&M focal points has been established. Generally, our R&M focal points work in the maintenance/quality assurance area. These focal points serve as the "eyes, ears and voices" of our R&M program. Their function is not only to inform and educate unit personnel but to provide our people a way to communicate their R&M ideas and concerns to the right people at the wing and Headquarters level. The unit focal point helps complete the feedback loop from the field back to the design shop so the next modification or follow-on weapon system is not an R&M irritant.

Another way for personnel to express ideas for R&M improvements directly to the Headquarters is to contact SAC's full time PRAM program manager. PRAM stands for Productivity, Reliability, Availability and Maintainability. PRAM will take good R&M ideas and build a prototype that can then be bought as a replacement for a poor performing piece of equipment. All that has to be done to make a suggestion is to call SAC's PRAM hotline—Autovon 271-PRAM. Even if a suggestion does not fit PRAM criteria, our PRAM program manager will ensure the proper people get the idea so that SAC's good ideas are not "lost in the wilderness." Again, you at the unit level are the key to success!

Already the unit focal points and PRAM hotline have paid big dividends. Two examples of excellent ideas from SAC experts in the field include modifications to the B-52 steerable television (STV) and the Minuteman III Launch Facility motor generator.

The B-52 STV is very susceptible to stationary light sources and burn spots on the tube often result. Those who operate and maintain the B-52 know the problem—too many burn spots and the STV is unusable. SSgt Michael Hughes, 416 AMS, Griffiss AFB NY, called 271-PRAM. He suggested we switch from a conventional TV tube to a charge coupled device that is not susceptible to burn spots. A tenfold improvement in mean time between failure and a savings of over 100 million dollars are expected from this suggestion. More importantly, our analysis shows that the resultant increased

reliability, in fact, increases B-52 Damage Expectancy . . . improved combat capability!

Another idea from the field dealt with the Minuteman III LF motor generator. The current motor generator has a sealed bearing unit that does not allow the bearing to be greased. This unit is experiencing many more failures than previously predicted due to bearing wearout. The suggestion in this case was to modify the motor generator by installing a grease fitting. This modification is expected to tremendously decrease motor generator failures which are considerably more expensive than routine servicing. In this case, reduced missile downtime equates to increased combat capability. MSgt George Masters, 91 FMMS, Minot AFB ND, submitted this suggestion.

These are just two examples of ideas from the field. PRAM suggestions are

mostly common sense ideas that exploit existing technology. Historically PRAM projects have a 5 to 1 payback on investment, but more importantly, can improve combat capability tremendously. These innovative ideas on how to make better, more reliable and maintainable systems will save the Air Force money and assure our systems work when needed. The overall result is increased readiness.

Which brings us to what improved R&M means to you. It means airplanes that will fly when needed, missiles that are on alert 24 hours a day, communication systems that will transmit when required, systems that require less servicing, reduced requirements for special training, reduced requirements for special tools and support equipment, and easier troubleshooting. Improved R&M means performance on demand . . . for you! ★★

THINK R&M . . . DEMAND R&M . . . LIVE R&M



CROSSFLOW

KC-10, B-1B, FB-111, RC-135—How Do I Get One?

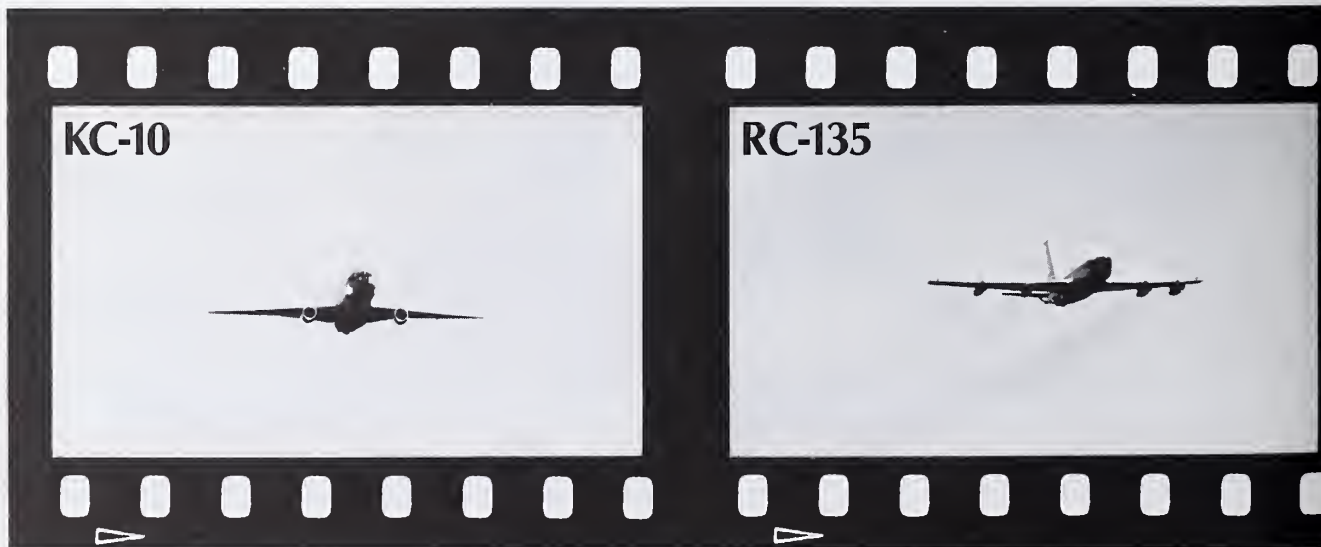
Capt Infinger
HQ SAC/DPROR

The methods used by the HQ SAC rated assignments shop to select crew members for crossflow to other weapon systems have undergone a change. Last year, SAC initiated the Commander Involvement Program (CIP) to increase the squadron commanders' role in the assignment process and to encourage more active participation in the professional development of the officers assigned to them. With this in mind, we decentralized the nomination process for weapon system crossflows to allow more wing/squadron level inputs. This gives each wing DO and SQ/CC an opportunity to tout the best people by accomplishing an initial screening process at wing level. The new selection process includes all weapon system crossflows within SAC (KC-10, RC-135, B-1B, and FB-111), and has recently been expanded to include all inter-command crossflow and exchange programs (MAC, TAC, AFSC, and ESC).

The mechanics are nearly identical to the process used for the April 87 KC-10 board. Each squadron commander will now be asked to nominate a minimum number of officers (exact number depends on the specific weapon system); however, there will be no HQ SAC imposed limit on the number of nominees as long as each nominee meets the criteria. The removal of a ceiling on nominations provides squadron commanders flexibility to nominate individuals who are deemed competitive for several weapon systems.

Once the wing DO and/or squadron commander determines who will be nominated, each nominee must prepare a package containing AF Forms 90 (from CBPO records), 942, 8, and flying history report. All packages should then be consolidated and forwarded to HQ SAC/DPROR along with a cover letter listing all nominees and endorsed by the wing DO. Individuals performing duties outside SAC do not need a cover letter but must additionally include copies of all training reports and OERs in their package.

Several questions are repeatedly asked regarding the crossflow selection process. The most frequently asked question is, "Why are limitations placed on the eligibility to compete for crossflow opportunities?" Officers also want to know why this eligibility criteria may change from board to board. Good questions! In a dynamic environment, flexibility is the key to success. Rated assignments officers must plan ahead to react to changing manpower conditions. For instance, 18 months ago the KC-10 selection board eligibility criteria was changed to exclude KC-135 instructor pilots from competition for the left seat and aircraft commanders from the right seat. Force demographics indicated SAC was entering a time when the mid-level captains comprised relatively small year groups. A continued flow of pilots in these year groups to the KC-10 would have eroded squadron experience to unacceptable levels, reduced instructors available for CCTS duty, and jeopardized the KC-135



force in the out years. The change was also a step in normalizing the KC-10 weapon system by introducing younger aviators. The end result should give operational units a self-sustaining, stratified aviator force, allowing the KC-10 weapon system to mature without total reliance on external sources.

The same reasoning applies to crossflow eligibility to other weapon systems as well. The outflow of a weapon system's primary source of experience and stability—instructors—must be controlled to preclude a detrimental impact on mission capability. Crossflow to other aircraft represents only one source of draw on weapon systems experience. Other sources desiring seasoned instructors include: CCTS, SAC selectively manned billets, Air Staff, USAFA, Joint/Departmental, Special Duty Assignments, rated supplement, aircraft test and evaluation, and worldwide special officer personnel requirements. Our job in Rated Assignments is to balance these requirements as necessary to ensure SAC will possess the resources necessary to execute its primary mission.

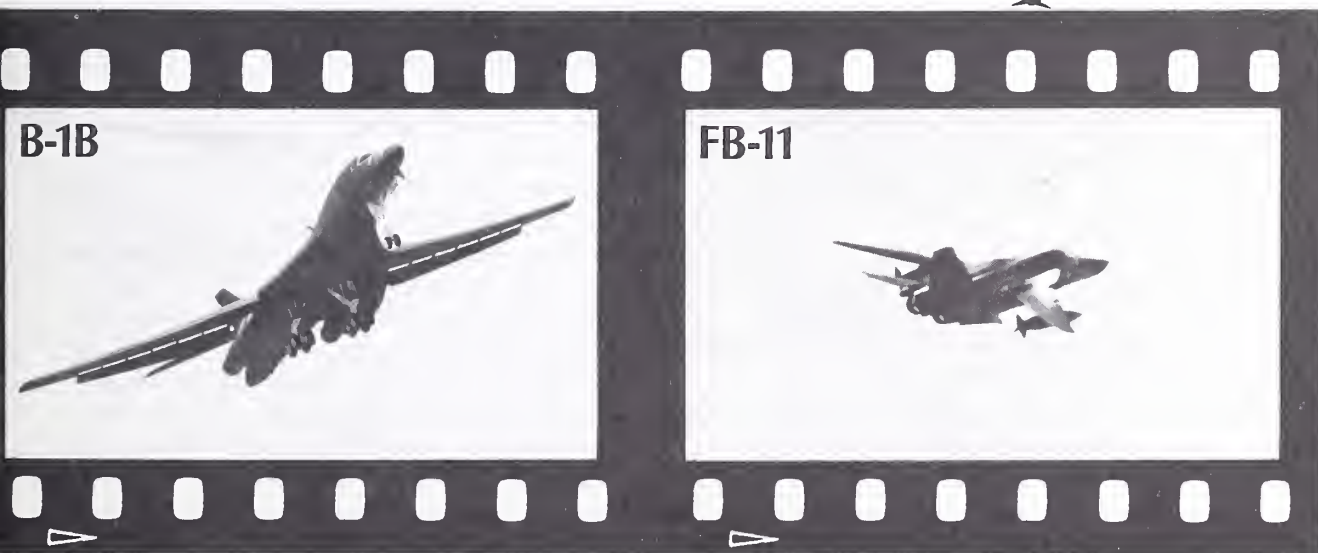
Another question concerns the specific evaluation criteria used by board members to determine individual scores. This question is often phrased in this manner: "What can I do to improve my competitiveness for selection?" This question is best answered by describing the "weighted value" scoring system, the selection package evaluation procedures, and the post evaluation review process.

Each selection board is comprised of rated officers from HQ SAC directorates (the past B-1B boards also included a representative from each NAF and the B-1B CCTS faculty at Dyess AFB). Each selection folder includes the package prepared by the nominee and the individual's command record, which includes OERs, training reports, and an officer career brief. The scoring is divided into three categories: flying duty performance,

performance reports, and PME/academic education. The flying duty performance category includes ACE flying time, Stan/Eval records, and flying training reports. The performance reports category includes OERs, training reports, and additional duties. Each category is individually scored using a 5-to-10 point scale with 1/2 point increments similar to a promotion board. The score for each category is then augmented by the weighted multiplier. Since flying ability/performance is primary in aircraft crossflow, it carries the highest multiple of 3. To ensure a well-rounded officer is selected, the performance category receives a weighted multiple of 2. The PME and academic education category has no weighted multiple. The total score is compiled by applying the weighted multiplier and adding the categories together.

After the evaluation is complete, the scores from each board member are examined. A differential in scores of more than six points for any nominee is resolved between board members before final processing. The scores are then tallied, and after reviewing stratification goals, those nominees with the highest scores are selected.

The intent of our selection boards is to provide an equitable system for identifying hardworking, high-quality aviators who desire crossflow to another weapon system. The assignments officers at HQ SAC take pride in policing the fairness of the selection process. However, it is impossible to make everyone happy, especially when considering the extreme competition for the few slots available. Those who work hard but are not selected should not be discouraged because perseverance and sacrifice will pay dividends in building a strong professional foundation. Further, although you didn't score high enough on one board doesn't mean you will not be selected on the next. Just ask your commander to nominate you again.



Are You ADF Equipped?



Capt Anthony L. Hinen
305 AREFS, Grissom AFB

Several years ago an experienced KC-135 crew flying a routine training mission became intimately involved in the rescue of a downed Navy A-7 pilot. The incident highlighted one more capability of the amazing tanker that most of us have never thought about—search and rescue. Today we'll look at that crew's actions, the equipment available to us in the "HC-135," and the specific techniques to use if you should be surprised with a rescue mission.

The single engine A-7 was on a night cross country flight, cruising at altitude, when he experienced a dramatic loss of thrust. All attempts to regain normal power were fruitless. The aircraft continued in controlled flight but was slowly losing altitude. When the fighter descended into a thick cloud deck the pilot wisely ejected. Albuquerque Center was tracking the A-7 but did not know that the pilot had bailed out. The unmanned

A-7 continued to fly for almost 120 miles before it crashed and disappeared from Albuquerque's radar. Consequently, Albuquerque focused their attention on the crash site. The Air Force was contacted and an HC-130 search and rescue plane was launched and given the coordinates of the crash site based on Center's radar.

Although unaware of the events that had just taken place, the tanker was headed in the general direction of the A-7, flying a night navigation leg at FL 350. It was not long before the tanker began receiving the fighter pilot's emergency locator beacon (ELB) over guard frequency. The pilot notified Albuquerque Center of the ELB transmissions and Albuquerque immediately responded with, "Are you ADF equipped?" The aircraft commander answered "Yes" and offered to help. Center advised the crew of the situation and then cleared them to search for the downed pilot. Because of the solid cloud

deck beneath them, the AC wanted a lower altitude. A quick check of the FLIP Hi-Chart for the minimum enroute altitude (MEA) along with the nav's chart, indicated that 12,000 feet was a safe altitude considering the high terrain in the area. Once level at 12,000 feet the tanker started slowing down and visually searching for the downed pilot. In spite of the broken cloud deck in the area it was not long before the boom operator spotted three red flares. The navigator then relayed this latest position to the HC-130 which was now within radio range of the tanker. Total time from start of search by the tanker until spotting the red flares was approximately 22 minutes. The tanker crew's sighting was the first indication that the fighter pilot was still alive. More importantly, the tanker redirected the search and rescue effort to the correct position which was 120 miles away from the initial position given to the HC-130 by Albuquerque Center. This story was a happy ending. The Navy pilot was picked up unharmed and after a medical examination was returned to his home station in California.

Now let's look at the equipment the crew used to locate the downed pilot. The primary instrument was the UHF-ADF (AN/ARA-25). The UHF direction finder automatically determines the relative bearing of radio signals in the frequency range of 225.0 to 399.975 Megahertz (MHz). The signals are received by the COMM#1 UHF radio only, using a separate direction finding antenna. Operation of the ADF is initiated by moving the mode selector switch on the UHF radio panel to the ADF position. Pointer #2 on each of the pilots' RMI's then shows the relative bearing to the station selected. While in ADF the separate guard receiver is disabled (remember the AN/ARC-164 UHF radio has two receivers, the transmitter and main receiver tune to the same operating frequency while the secondary receiver only receives the guard frequency). The transmitter still operates in ADF mode; however, using the transmitter interrupts ADF operation. When using the ADF it's normal to have slightly distorted and reduced reception of audio signals. If you have an ADF that's giving inaccurate readings, don't just sign it off, write it up!

The other equipment available to us in our "HC-135" include the radar, TACAN, and INS/DNS. Use them to determine the tanker's present position. I'll skip the detailed discussion on their operation. Now let's move on to the specific techniques to use.

First and foremost, Fly the Airplane. Maintain your position awareness and don't let your crew coordination break down. Be especially mindful of your altitude and airspeed. Getting low and slow on a search and rescue mission can kill you just as easily as getting low and slow on an instrument approach. Second, now's the time to figure out a bingo fuel. You want to have this figure

available before the situation gets hectic.

Next, select ADF mode and guard frequency—243.0 MHz—on the COMM#1 UHF radio. Of course, this assumes you're listening to an emergency locator beacon. You could also home in on any other UHF frequency like those in the AN/PRC-90 radio found in our survival kits. Once you have ADF lock-on, turn in the shorter direction to place Pointer #2 in the 11 o'clock position on your RMI (assuming zero drift). This is better than flying directly to the station because you won't overfly it and have to turn around. Instead, maintain your ground track and wait for Pointer #2 to drop to the 9 o'clock position. When this occurs, start a left turn to place Pointer #2 in the 10 o'clock to 11 o'clock position and maintain ground track until it falls to the 9 o'clock position again. If you continue this process you will eventually be in a continuous left hand turn circling the downed pilot. By now you might even consider lowering flaps, depending on gross weight. The slower speed will allow you to fly smaller circles but watch your AOA and keep a close eye on your fuel. With the left wing down, the AC will be able to visually search for the downed pilot. The boom operator now becomes a key player in the search and rescue mission. Send the boom to the pod to visually scan the ground from the rear of the airplane.

Let's back up a bit and focus in on the navigator. Again, the nav must insure that the pilots are Flying the Airplane at all times. He can cross check altitude, AOA, and be watching the radar for high terrain. The nav can then figure the estimated position of the downed pilot and relay this to the appropriate agencies. The nav does this by drawing a line of position (LOP) using the ADF bearing from the tanker's present position. With three LOPs the nav can triangulate the position of the downed pilot. Of course, the nav can use a radar fix, TACAN fix, or INS/DNS, whichever is most accurate, to determine the tanker's present position. Once you've located the downed pilot you can loiter in the area until rescue forces arrive or until you reach your bingo fuel, whichever comes first.

That's it; search and rescue procedures in a nutshell. I've talked specifically about the tanker but these procedures will work with any plane equipped with an ADF. Who knows, maybe you'll be surprised with a rescue mission. . . now you're ready. 

About the author. Capt Hinen graduated from the Air Force Academy in 1981 with a B.S. in History. He completed pilot training at Laughlin AFB in 1982 and received an assignment to the 924th AREFS at Castle AFB in California. From there, he went to SOS prior to his arrival at Grissom AFB, where he is currently assigned as a KC-135 aircraft commander.

VDP Options

Maj Greg Fonner
SIFC, Castle

Here's a quote from AFM 51-37. The VDP is a defined point on the final approach course of a **nonprecision** straight-in approach procedure from which a **normal descent** (approximately 3°) from the MDA to the runway touchdown point may be commenced, **provided visual reference with the runway environment is established.** (Emphasis added by the author.)

Precision approaches don't need a "VDP" because glidepath information is already provided, and it shouldn't be too surprising to note that the "normal descent" of approximately 3° is designed to put you in a position where your nonprecision approach and landing looks suspiciously like all your precision ones; that's only smart planning. In many cases the smart planning has been accomplished for us by the approach designer, and the result is published right on the approach plate. When there isn't a depicted VDP, there are ample techniques in use by which pilots can figure one out.

The trouble with VDPs is that sometimes we don't have visual reference with the runway environment when we arrive at the VDP. What then? A safe conservative technique is to go missed approach, but that's not always the best solution. Besides, there's always the argument that VDPs are not a mandatory part of the approach procedure and are only intended to provide additional guidance. A pilot doesn't have to go missed approach until arriving at the missed approach point. A pilot can choose to land if acquiring the runway past the VDP, but a different descent gradient will be required to land at the normal point.

What follows is a technique that should help you to put some boundaries on the task of landing from a nonprecision approach when the visibility doesn't let you see the runway at the VDP. Once we've passed the VDP and are continuing towards the MAP, our required descent gradient gets steeper and steeper. The question finally becomes — what's too steep to handle? The answer to that question depends on lots of factors — including pilot skill, recency of experience, currency, aircraft configuration, etc. You'll have to decide how steep is too steep. Here's a way to figure what might be required.

Take the height above touchdown and divide it by the visibility required to shoot the approach. This technique will give you the descent gradient required to land if you see the runway at the visibility minimums. It doesn't tell you if it's a smart move or not, that's up to you. Let's take a look at an example. (See figure 1)

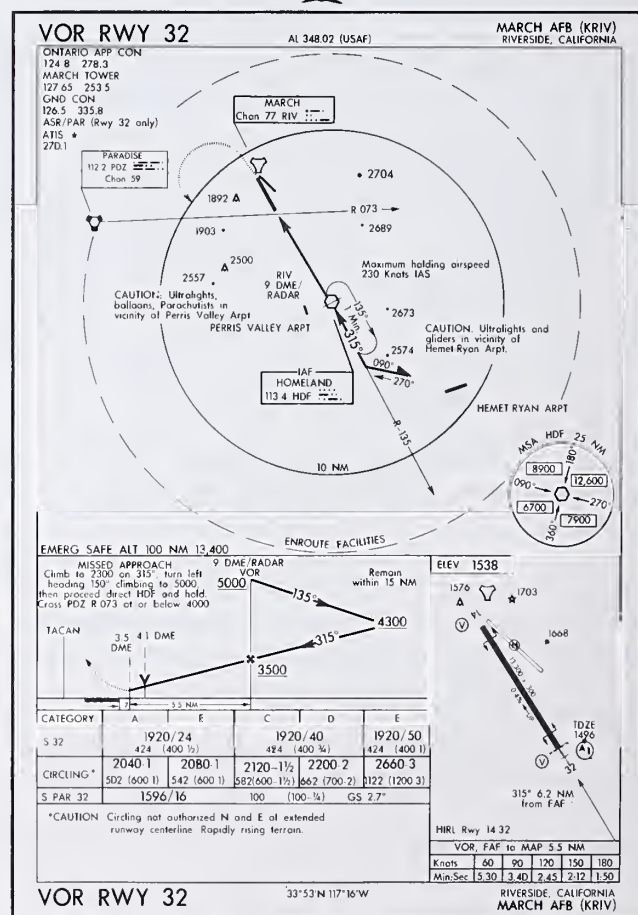
You're flying your D category jet into March AFB and are cleared for the VOR RWY 32 approach. The visibility is poor with a reported RVR of 4000 (3/4 mile). If you see the runway at 3/4 of a mile you will be 424 feet above the runway (HAT is 424) with 3/4 of a mile left to travel. 424 feet divided by .75 miles yields a 565 ft/nm gradient required to land the aircraft at the normal touchdown point. Most pilots would

round that to a 6° gradient. At 150 knots on final (2.5 miles/min) that equates to a VVI of about 1500 ft/min.

Before you throw up your hands and tell me I'm crazy to figure all this out, remember that it's just an exercise to help put a boundary on the landing decision. By doing this, you've at least armed yourself with some information you might not have thought about before. You know the "worst" that might be required. Having been the IP in airplanes where the pilot has "seen the runway late" and attempted to land, I can tell you that seeing the concrete at the end of a weather approach can be a powerful draw if a pilot's not prepared. Now that you know the "worst," ask yourself some questions.

Can you afford to land long and still be in the first third of the runway? This will decrease your required gradient. Are you partial or full flaps? Is the runway wet or dry, icy or clear? Are you light gross weight or heavy? You get the picture. Have a good VDP in mind and use it. But when the weather gets bad, know what might be required of you. Then ask yourself those other "what if" questions. It might be your time to find another approach, or even divert to your alternate. Whatever your decision, make sure you know what you've based it on and fly safely.

We'd like to extend our thanks to our Canadian friends from the Instrument Check Pilot School for this month's topic. They're experts at flying in low visibility conditions (low ragged ceilings and lots of blowing snow) at airports where nonprecision approaches are the rule. If you have questions, give us a call at 347-4571.



SIFC

The SAC Instrument Flight Center provides some of the best instrument information and techniques for the crews. Their superb analysis and explanations are required reading for crew members to stay current on instrument related topics. The staff consists of Lt Col Vogt, Maj R. D. Williams, Maj Greg Fonner, Capt Pete Katsufakis, and Capt Ric Feely. Each member contributes insights and techniques making it hard to single out a sole author for each article. One member, however, does coordinate everyone's efforts in turning out a quality product. Recently Capt Katsufakis did not receive credit for his fine article on "Missed Approach Considerations" and it won't happen again. Remember, SIFC is always looking for new ideas. If you have an idea, give them a call.

The Banner Year Continues...

General Chain presents the Outstanding Weapons Safety Officer plaque to Capt Roderick Gibbs, Jr., for his distinguished service during 1986 as Chief, Explosives Safety Branch, 1st Strategic Aerospace Division, Vandenberg AFB.



Capt Matthew B. Randolph
Carswell AFB

Whether you have been in your cherry red, stylish sports car or in your rusty, iron, dependable cruiser, how many times have you seen a rock, board, or some other object fall from a truck and bounce off your hood or windshield before you could react? It happens all the time. Just think, then, about the low altitude environment and how similar it is to that highway you travel every day.

The low altitude environment, like a highway and its debris, is full of hazards that can impede your travel. In this case, we're obviously talking about BIRDS. Birds pose a significantly greater risk to you and your crew, mainly because your flying machine carries you much faster than your ol' mechanical stallion there on the highway.

More often than not, encounters with birds are nonincidental. As you know, evasive maneuvers by the birds, not the pilots, usually prevent the mishaps. However, when the birds and aircraft are destined to meet, they do so with a variety of effects.

Some birds strike with only a dull thud or no thud at all (perceived by the aircrew). Many of us can relate to that. The only record of their impact is the smudge or ding discovered on the aircraft postflight. Others strike with unbelievable force, piercing aircraft skin, causing engine failure, and/or penetrating the "safe," familiar confines of the cockpit. It is the latter case with which our B-52H crew can personally relate.

Recently on a bomb run in Forsyth, Montana, a bird struck the aircraft with an awesome destructiveness. One second after a simulated missile release, at 340 knots IAS, 450 feet AGL, an unseen one and one-half pound Horned Lark shattered the pilot's front window (#2R). The bird did not penetrate the

two-paned window. The outer pane remained intact, although bowed, while the inner pane exploded into the cockpit.

Everyone on board felt the impact on the airframe and the effect of the implosion on the cabin pressure. Initially, most of the crew members thought it was a midair collision. The aircraft commander, pilot and instructor pilot were each knocked against their seatbacks by the shotgun effect of the blast. The electronic warfare officer and

"It was S But Not



gunner heard the loud "boom" and contemplated ejection, while the navigation team saw the glass falling down the hatch behind them and wondered about the status of the aircraft and the pilot team.

The aircraft commander, who was flying at the time, initiated an immediate climb at about the same time the radar navigator broke the eerie silence over interphone with the words "Pilot, climb!" The AC acknowledged. The IP, covered with glass like the other pilots,

quawking, Mode 3"



leaned forward to check on the pilot. The pilot wasn't moving and his head was hanging down with his chin against his chest. The IP shook the pilot and asked him over interphone if he were OK. The pilot reached forward and appeared to engage the interphone switch on the control column, but nothing was heard. The IP gained the pilot's attention, repeated his inquiry over interphone, and motioned for a "thumbs up" from the pilot. The pilot acknowledged with his own "thumbs

up." The AC continued the climb to 10,000 feet.

Upon further inspection of the AC and pilot, the IP discovered that the blast had disconnected the communication cord on the pilot's oxygen mask, thereby explaining his inability to communicate. As for the pilot's condition, it was ironic that the IP happened to check on the pilot when the pilot was investigating the extent of his own injuries. The pilot had received a significant blow, with moderate

discomfort, to the upper chest and arms, and was worried that he may have been impaled with fragments of an aircraft or bird. He had lowered his head to detect any injury when the IP understandably showed great concern for his welfare.

The AC leveled off at 10,000 feet. The outer glass window pane remained intact and the cabin remained fully pressurized. A large amount of glass was strewn throughout the cockpit, covering and jamming switches in many instances, but not affecting mission safety or completion. A visual exterior inspection by another aircraft revealed no other damage.

On the way home, the pilots realized how fortunate they had been. None of them received any serious injury, only cuts and bruises. All three had their helmet visors down when the bird struck. The glass pitted their visors, nametags, and CRU-60s, giving evidence as to the reality and potential severity of the bird strike hazard.

Needless to say, the aircraft recovered without further incident. It must be emphasized though, that since none of the pilots saw the bird, the bird struck without warning. There was no time to duck left, right, or under the instrument panel/glareshield. As confirmed by the flight surgeon, each of the pilots escaped severe eye injury because he was using his visor. So the next time you're flying in the bird's arena, think about the reality of a serious facial/eye injury, the loss of your livelihood or career, or the loss of your life. You, like our crew, may be convinced that the helmet visor is priceless. It is there to be used. **Fly smart. Fly safe.** 

About the author. Capt Randolph graduated from the University of Colorado at Boulder, in 1982, with a degree in Aerospace Engineering. He completed UPT at Columbus and has been stationed at Carswell since Sep 1984. He served as a senior stan/eval copilot until Feb 1987, and currently is assigned as a pilot with the 20th BMS at Carswell.



One Summer Afternoon

Capt William S. Huggins
AFIT, Lyon, France

"AC, nav — our estimate to the fix is 1644."

"Roger, nav — give the command post an inbound call as soon as we get in range. Pilot, let's look at the approach again, it's been a month."

Boy, am I glad to be getting back. Even though we spent three weeks of our Alaskan Tanker Task Force TDY at Hickam, a month is still a long time to leave the wife alone with the three little ones.

"Nav, AC — center has been rerouting everyone around weather between our next checkpoint and the base. How about keeping a good eye in the radar?"

"AC, nav — will do. Everything looks good in the scope right now."

It's good to have one of these new solid state radars on board. Picture clear as a bell. I can even paint grain silos. If there's weather out there, I'll see it. I suppose anyone who can navigate from the equator to the arctic circle could handle a little weather.

"AC, nav — I got the command post and passed 'em our down time. They say that the weather folks are calling for thunderstorms over the base later on. They say that if we get delayed en route more than 15 minutes, we'll have to divert."

"Roger."

"Say, are the wife and kids going to be at base ops?"

"Yeah, that's the best part of a TDY — the homecoming."

— A Little Later —

"Nav, AC — How about making another weather scan? Center wants to vector us way west for weather. Do you see

anything? If I accept their vectors, it'll eat up our 15 minute pad."

"Pilot, nav — I'm showing nothing out to 100 miles. I think we should press on."

Gee, I don't know. I don't see anything but a little fuzz, must be rain showers. It's certainly no storm return. Besides, ATC always says they aren't equipped to paint weather. Five hundred hours in the tanker and headed for instructor school in two weeks, I ought to be able to read a radar. Besides, if we divert who knows when we'll get back . . . Hey, it feels kind of good to make a decision, take a little risk.

"Crew, AC — Descent check. Pilot, request lower; nav, it's up to you — keep us out of the soup. Call command post and get an update on the thunderstorm they're expecting."

— Later —

"AC, nav — Control says they expect to be closing the base in about 35 minutes. I've got us 23 minutes out.

"Roger that, nav — we'll be requesting an enroute descent to the ILS. We've got no time to fool around with the published penetration."

— A short time later —

"Nav, Pilot — It really looks rough up ahead. Still nothing in the radar?"

"Pilot, nav — Yeah, well, I've got some rain showers but nothing that's giving me a very strong return."

Man, it's getting pretty rough, but I still see nothing but rain in the scope. On top of that, the TACAN shows us 45 miles out and I still can't paint the base yet.

— Still later —

“Nav, AC — still nothing?”

“Nothing.”

“Okay, well, there’s a hole over there and I can see the ground. Pilot, ask approach for 8000 and tell them we’re turning 30° right to avoid weather.”

“Roger AC, but it looks just as bad over there. I think we should consider diverting.”

“It’s okay Pilot, we’ll make it in.”

Now what do I do? No real weather on the scope, we’re 15 miles out, and I still don’t have the base on the scope. I should be able to paint my **garage** from here!

“Boom, AC — check the passengers, it’s really getting rough. Nav, talk to me!”

“AC, nav — I don’t get it. Still nothing worth mentioning on the radar. . . and control just called to say that if we aren’t on the ground in 10 minutes that we will **have** to divert.”

— After what seemed like an eternity —

We’re bouncing around so much I can barely read the compass! And, we’ve got 13 passengers counting on us to get them on the ground alive. . . We must be IN a thunderstorm! We’ve got to get out of here.

“AC, nav — I don’t know what’s going on with the radar, but I can’t take us any further! Right turn, heading 270 towards the clear. We’d better divert.”

(The pilot told me later that, at the moment, those were the sweetest words he could have heard.)

“Roger nav, give command post a call and coordinate it.”

Boy, what a ride! How did I get us into that mess?

In looking back on what has been a thankfully unremarkable eight years in aviation, I remembered the events of an otherwise commonplace midsummer afternoon return from a TDY. It could have been the last midsummer afternoon for four crew members and 13 innocent, trusting citizens. Having, since then, lost friends to errors of airmanship no more serious, it would seem, than those committed aboard our airplane that day, I find that recounting these events as a cautionary tale is therapeutic. It helps calm the dull fear that the sort of everyday, nondescript, “understandable” mistakes we all make can quickly cost us dearly in the air. In this episode I see three mistakes; perhaps you see more. I’m not talking about checklist deviations or other esoteric procedural errors you might divine from the dialogue. I mean common, garden variety human weaknesses, which, unlike a bad crosscheck, are very hard to train out:

1. Complacency
2. Bad decisions based on a lack of equipment knowledge
3. Get-home-itis

1. Complacency — As a navigator with two years and 500 hours of experience at the time, I was as experienced as almost half of the navigators in my squadron. I was returning from a TDY that had exposed me to a broad range of navigational challenges. I was headed for SAC’s Central Flight Instructor Course in two weeks. I felt confident, even relaxed. Danger sign! Confident and relaxed is okay accompanied by capable and alert. I had only half the recipe and didn’t know it.

2. Bad decisions based on lack of equipment knowledge — About a month after this episode I found myself in a systems class at instructor school. An instructor who actually WAS experienced was explaining that extreme care needed to be

taken in tuning the new solid state radar for weather. Even properly tuned, the radar would still be more difficult to interpret than the old set until you grew accustomed to its idiosyncrasies. The danger on the flight one month earlier had been that I wasn’t aware of these idiosyncrasies and, worse yet, that I didn’t **REALIZE** that I was ignorant of them. Why couldn’t I find the base in the radar when the TACAN showed us well within the radar range I had displayed? The radar had been working fine the whole flight. There must have been something (mountains, a thunderstorm?) between me and the base. Well it wasn’t a mountain, since we were flying over some of the flattest terrain SAC ever colonized.

3. Then there was Get-Home-itis. This disease is fairly harmless if you get it standing in the express lane at the commissary ten minutes before the first pitch of game seven of the world series, but it is big trouble in the air. We are trained to accomplish aircrew duties at a methodical, efficient rate. Get-Home-itis poses a double-edged threat. It leads you to accelerate or compress activities, substantially increasing the prospects for error. Further, it distorts your judgment in making decisions about future measures or courses of action to be taken. The pilot and I both had families waiting for us. We were already mentally in base ops. We had decided we could make it within the command post-imposed time limit and despite the ATC weather warnings, before we ever got to the rough stuff. Moreover, we were very reluctant to review those ill-conceived decisions, even when the actual conditions we encountered begged us to do so.

It is not just the flight regime. How many of us drive home from base ops or set out on leave with the family tucked into the van, only to commit one or more of these same errors before we’ve even gotten a good station on the radio?

We can’t escape ourselves, our weaknesses. Yet, with a bit of conscientious and sustained effort, we can control these tendencies: complacency, incomplete knowledge, haste:

1. Fly every flight like a recheck. Perhaps an unrealistic standard, but a good goal to shoot for. Take satisfaction in what you do well, but be an unrelenting self critic, accepting nothing but the best.

2. Any new piece of equipment takes time to learn. In the meantime, leave plenty of margin for error. Don’t bet your life on the equipment till you know what it can (or can’t) do.

3. History is replete with examples of the adage “Haste makes waste.” Don’t provide any more. It has been convincingly proven.

Well worn advice, to be sure. Though it is certainly not the first time it has been offered, it becomes no less valuable with another hearing. Luck is not enough. I used up a lot of luck that summer afternoon. I hope never to need that much again. **Fly smart. Fly safe.** 

About the author. After completing UNT in 1979, Capt Huggins served with the 905 AREFS at Grand Forks AFB as a KC-135 navigator. In 1983, he moved to Castle AFB where he was assigned as a stan/eval instructor navigator with the 93 BMW. Capt Huggins is currently an Olmsted Scholar at the Institute for Political Studies in Lyon, France.

Proud Shield 87

Bombing/Navigation Competition

Capt Gary Finchum
HQ SAC Proud Shield Project Officer



Since the initial competition in 1948, Strategic Air Command crews have tested their skills in the friendly but determined arena known as the SAC Bombing and Navigation Competition. Over the years the competition—known affectionately as “Bomb Comp”—has helped build morale and sharpen the competitive edge of SAC’s bomber and tanker crews. More importantly, the competition has served as a barometer of SAC’s capabilities as it progressed from the WWII vintage B-29 to the sleek, supersonic B-1B of the 1980s.

Although foreign participants will not compete in 1987, we see for the first time the introduction of the 43d Bomb Wing from Andersen AFB, Guam. Twenty-three SAC aircraft wings will compete along with six Air National Guard units, six Air Force Reserve units, and one F-111 unit from TAC. In addition, F-15s and an E-3A will participate in the fighter intercept exercise. This year has the 28 BMW and 96 BMW showcasing the B-1 with each unit flying one orientation sortie during Phase I and Phase II in preparation for full participation in 1988.

This year’s competition provides a new and exciting scenario developed by crew members who have never participated in a SAC Bombing and Navigation Competition. The command strived to add more realism to the competition and to give crew members the opportunity to compete.

The first segment of the competition is the aircrew selection phase. Unlike past years, where wings were given the flexibility to select their competitors, every available bomber and tanker crew participated in a wing competition. Each bomber crew flew two STR scored bomb/SRAM runs. KC-135 aircrews flew one celestial navigation leg terminating over an STR site. KC-10 crews flew one STR scored orbit exercise. To prevent units from grooming just two crews, the scores were never sent to the units. Five days prior to the competition, HQ SAC will rank each unit’s scores and will select the top scoring crew as the first of four unit

competitors. The next three competition crews will be selected randomly from the top fifty percent of scores. Another twist to this year’s competition is the fact that HQ SAC also picks the three aircraft the unit can use in the competition. Additionally, aircraft modifications are no longer allowed.

Phase I begins 1 October with 26 KC-135s and three KC-10s launching in the early evening and ends 6 October with 11 B-52s and three F/FB-111s attacking simulated targets in the Strategic Training Route Complex (STRC). During the first two days of Phase I, KC-135s are challenged with a “back to the basics” night celestial navigation leg and orbit exercise where the crew cannot use programmable calculators or any computer generated products. During the next two nights, crews fly the same profile except perform an enroute rendezvous with another competition tanker and then the two-ship tanker cell will rendezvous with a competition bomber.

After the refueling the bombers continue on their EWO profile bombing mission into the STRC. B-52s simulate one high altitude bombing and then all bombers descend to the low level route. Flying at approximately 600 feet, the bombers will simulate attacking several bomb and SRAM targets while countering ECM threats along the route of flight.

KC-10s also compete in a revamped competition. KC-10s will launch from home station in cell; one with a tanker mission and the other as the receiver. After leveling off, they begin a scored air refueling. Points are awarded from the tanker based on toggle time and offload. The receiver faces a much greater challenge to receive points. Like the tanker, he also receives points based on minutes of toggle time but the point value for each minute of toggle time goes down with each disconnect, whether it was inadvertent or not. After the air refueling, the tanker KC-10 lands at a simulated forward operating location. The crew is then graded on cargo downloading procedures and servicing the aircraft with fuel,

hydraulics, and oil. After air refueling, the receiver KC-10 begins an inertial navigation exercise followed by an orbit exercise. The crew then continues to the forward operating location and is graded on cargo upload procedures. KC-10s reverse roles in Phase II.

Of the four competition KC-135 crews, only the top two crews from Phase I continue in Phase II. Flying an entirely different route from the initial phase, the crews can now use computer products and calculators to improve their precision navigation during a day celestial navigation leg and orbit exercise. Completing the orbit exercise, the crews will land at a simulated post refueling base (Whiteman AFB, MO) where 1 CEVG will score the crews servicing the aircraft with fuel, hydraulics, and oil.

Phase II represents the conventional scenario for the bombers. Flying through the Nellis Military Operations Area the bombers will pick their way through an area defended by F-15s directed by controllers on board an E-3A AWACS aircraft. Units are encouraged to use new ideas, techniques, tactics and innovative procedures to avoid or negate the fighter threat. After the fighter exercise, the bombers will attack a target heavily defended by simulated surface to air missiles and anti-aircraft artillery with two inert bombs. Exiting the range, a portion of the bombers will recover at either Fairchild AFB or Mather AFB. There the crew will upload fuel, hydraulics, and oil.

The 1987 SAC Bombing and Navigation Competition culminates with a symposium hosted by 8AF at Barksdale AFB. The two-day symposium offers the opportunity for all crew members and staff to participate in the free exchange of ideas, tactics and procedures. This includes the fighter pilots and threat operators as well as the SAC tactics staff. *But best of all it provides an opportunity for General Chain and the SAC senior staff to recognize “the best” in SAC in 1987.*

Good Luck...

FLY SMART. FLY SAFE!



B-52 MISHAPS

FORECAST vs ACTUAL

1985 Forecast	Actual
1 - Class A (Ops)	0
1 - Class B (Ops)	0

1986 Forecast	Actual
1 - Class A (Ops)	0
1 - Class B (Ops)	0

1987 Forecast	To Date
1 - Class A (Ops)	0
1 - Class B (Ops)	0

Attention B-52 Crewmembers

**Some Air Force Statisticians predict
one B-52 Class A Mishap in 1987.**

YOU can prove them wrong!

Fly Smart.

Fly Safe!



Dropping Iron

1Lt Peter W. Gretschesch
60 BMS, Andersen AFB

"RCD...connected, light on."

"Bomb doors...Open."

"Bomb release monitored...bombs away!"

"Bombs away? Uh, Oh." So we'll have to explain our way out of a bad STR site score, right? Wrong. This time we have over 27,000 pounds of live bombs refusing to release properly and our "score" isn't decided by a tone-cut over UHF radio. The story we'll have to tell back at the club is why there's no mile-long train of craters where our radar crosshairs were.

Although SAC's reputation is built on strategic nuclear deterrence, B-52 crews are now spending much of their time training for conventional bombardment. Major General E. G. Schuler, Jr. (SAC's Deputy Chief of Staff, Operations), writing in April 1987's *Combat Crew*, challenged us to hone our conventional warfare skills. From the upper echelons of SAC's decision makers to the operational level, everyone in our command is working hard to expand conventional warfighting credibility. Part of the "work" is the valuable opportunity for flight, maintenance, and munitions crews to get hands-on experience with ordnance that realistically goes "BOOM!" when released. Recently, in the case of our crew, we learned how to deal with live weapons and their associated systems when they don't work as advertised.

The particular mission didn't start as a routine training sortie. This was obvious as the entire crew huddled around our navigator to watch him meticulously count 55 bomb pins. The standard preflight takes a good deal longer when bombs, racks, fuzes, ammunition, flares, and a nonstandard fuel load are added to the usual

training baggage. Takeoff and climbout, however, were uneventful. I doubt anyone onboard noticed a difference from a typical heavyweight water-injection takeoff. After air refueling and pre-bomb run crew duties, we settled in for what we thought would be a textbook lesson in how to "drop iron."

Thirty seconds ahead of us, lead released his load of live MK-82's and banked away from the target. The explosions ahead didn't appear real without the sound effects; from inside the cockpit we couldn't hear the concussion-wave blowing away the surrounding brush or smell the cloud of smoke and debris we were about to fly over. Now, it was our turn. The navigator told us timing was right on the second. The next thing we knew, the radar navigator said something about bomb release lights not flashing properly. I strained against the lap belt and out of my seat to look back at the target, a barren island in the middle of lots of Pacific Ocean. Our light and smoke show was obviously a dud compared to lead's.

Tech order guidance can appear sketchy especially if it wasn't discussed thoroughly beforehand. We had to depend on local procedures and common sense. Instinctively, our first reaction was to recount the bomb pins, check circuit breakers and review bomb run procedures. They all checked. First priority was positively verifying the number, location and condition of the reluctant weapons. From the cockpit, the external bomb racks were just out of sight. Holding our signal mirrors against the side windows, however, we looked over our shoulders and immediately confirmed 24

external bombs did not release. I knew those survival-vest mirrors would come in handy someday.

The cell finished its bomb run and was reforming. Lead gave number three permission to fly loose visual on us to make a further inspection. Since contingency training is in cell formation, you'll usually have a built-in chase ship available. Luckily, our external bombs appeared secure on their racks. Since no fuze arming wires were dangling in the wind, we felt pretty sure the externals were unarmed.

SACR 50-4 (Vol I, Chap 11) specifies a mission/weapons qualified crew member will make a visual check of the bomb bay as soon as possible after live releases, but definitely prior to the next bomb run IP. The navigator really earned his flight pay that day since he was designated "bomb bay inspector" in our ground brief. The only way to examine the bomb bay is to squeeze out the pressure bulkhead door and crawl through the forward wheel well on a 12-inch wide catwalk (dragging a parachute behind the whole time). We obliged the navigator by pulling the forward gear circuit breakers and the bomb door relay control circuit breaker to prevent inadvertent gear actuation or bomb door opening during his inspection.

Descending to 10,000 feet and depressurizing the cabin according to the Dash 11, we turned the air conditioner off and waited 15 minutes for the catalytic filter to cool. The BV modified air conditioners have the hot filter installed beside the catwalk rather than next to the air conditioning package. It's a definite burn hazard to anyone on the walkway until cooled. The navigator made a thorough check of the weapons, the bomb shackles and fuze arming wires, then returned to the crew compartment as quickly as possible. We repressurized and reset the gear circuit breakers.

Once again, the situation turned out better than it might have been. Only nine of 27 internal bombs released, but the remaining 18 appeared secure and unarmed. In our pre-flight brief, we decided to abort the mission for hung internals. We also determined that jettison and Emergency Armed Release (EAR) were not options for this peacetime mission. Had all internals dropped, however, we would have attempted a second release of the externals using normal release methods (OAS or D-2).

After the navigator reported the configuration, it was time to plan a safe recovery. We left the bomb door relay control circuit breaker out to take advantage of a safety feature of the cluster bombing system: no release of weapons is possible until the bomb doors are fully open (door limit switches closed). The pilot's calculations with the weight/balance sheet and the slip stick determined which fuel distribution and sequence would keep our center of gravity within safe landing limits. With 24 external bombs throwing the aircraft's center of gravity

significantly forward, we used the Dash 11's "Fuel Sequence When Carrying External Non nuclear Weapons" as a guide for the remainder of the flight. Our combination of operating weight CG% MAC and 12,800 pounds of externals did not require wing tank ballast fuel. If some external bombs dropped leaving a lateral imbalance, we were prepared to adjust the fuel distribution to regain normal lateral control. Since our loads were 500 pounders, we weren't restricted by the Dash 11 WARNING not to land with 1000-pound weapons in the nine bottom stations of cluster racks. Following SACR 50-4, we recovered along a prescribed safe route to the landing base, avoiding populated areas.

Of course, touch and go's and simulated emergency procedures were out of the question. After 45 minutes of gross weight adjustment in a holding pattern near home base, we declared an IFE with ARTCC. Whether or when to call the IFE is based on local procedures and aircraft commander judgment. In our configuration, with unarmed weapons, the landing was the only critical phase. We adjusted gross weight to land around 250,000 pounds with approximately 40,000 pounds of fuel reserve. We chose a circling approach to our base's alternate runway. If we ran into problems, better not to disable the primary runway. The circling maneuver took us over the ocean, away from populated areas on and near the base. The fact we also had live flares and ammunition onboard made avoiding populated areas even more critical. One last check showed the aircraft's center of gravity well within limits.

This was not the time for a solid carrier landing that might shake a bomb or two loose. The aircraft commander landed with as little sink rate as possible, sacrificing a shorter landing roll for less G forces. We cleared the runway and ground crews arrived immediately to inspect and pin the ordnance. Just another day's work done.

B-52 contingency warfare training using STR sites or inert bombs ("shapes") is the norm for many economic and logistical reasons. However, occasional exercises with live ordnance provide valuable realism keeping the flight, maintenance and munitions crews honest. For example, how many flight crews regularly brush up on their hung bomb procedures? Thorough pre-flight planning for unforeseen problems like hung bombs is crucial for an uneventful recovery. Since our crew's flight with 42 hanging MK-82's, we've given that type of emergency more consideration. Major General Schuler stresses "challenge" is SAC's lifeblood. Certainly, the challenge of "dropping iron" will motivate a crew to perform at its highest potential every time.

About the author. A graduate of the University of Pennsylvania, 1Lt Peter W. Gretsches is assigned as a B-52G pilot at Andersen AFB.

"Time to Decide"

Capt William E. Roberts III
410 BMW, K. I. Sawyer AFB

Pilot premonition maybe, but I felt something was going to happen. With 40 seconds to go to the third release of our bomb run at 340 TAS, level 3000 ft in and out of the clouds I had time to see a flock of ducks on their way to meet us, head on.

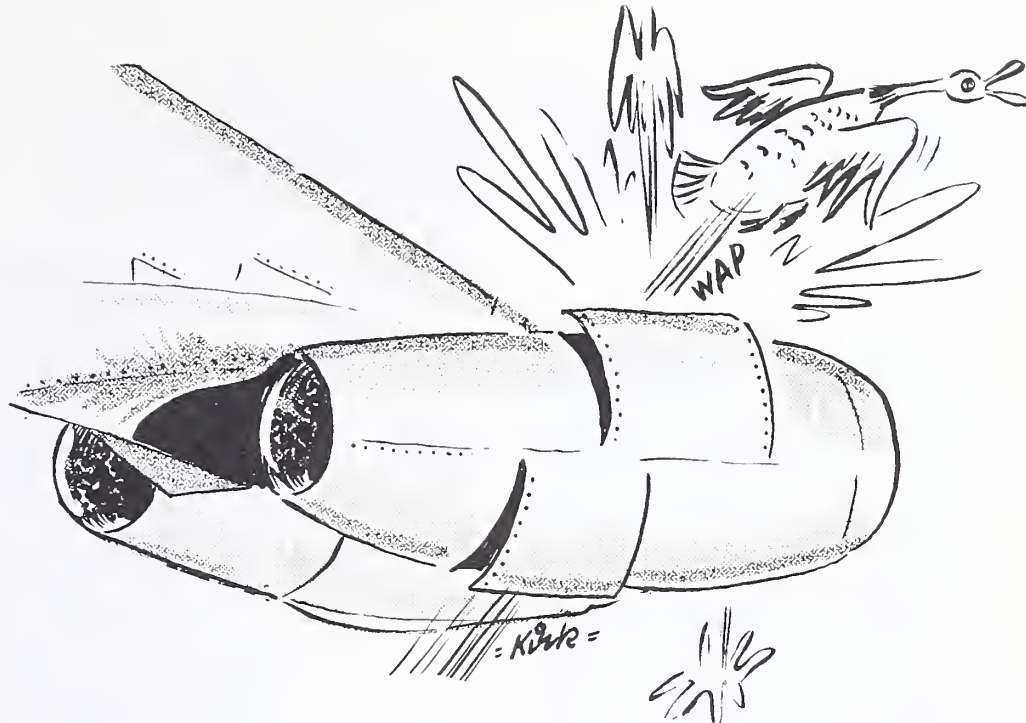
After saying "ducks" over interphone, I felt the aircraft shudder slightly. It was now 30 TTG. I looked out the window to inspect the damage and saw that engines 5 and 6 had structural damage. The metal was peeled like foil and there were copious amounts of duck blood under the wing.

"25 TTG," I told the crew. "We've taken bird strike and there is visual damage." The AC calmly announced, "Monitor engine instruments and let's finish this bomb run."

The engines looked fine on the instruments: EPR, RPM, EGT, Fuel Flow. No fire or overheat lights, hydraulic pressures good, generators on line. After tone cut, I gave the bomb sight post release and advised them of the bird strike. They asked if we needed assistance.

"No," I told them, but added a warning to other crews in the area. I also asked them to call our home station and tell them we'll contact them as soon as possible.

The AC said, "After we are safely leveled off we can accomplish the bold face procedure for emergency engine shutdown." Recognizing the fact that serious engine damage can occur from bird ingestion without accompanying abnormal indications, we shut down



engines 5 and 6 in accordance with the tech order.

Safely leveled off with plenty of airspeed and altitude we began to assess the damage. Number 5 engine: loss of normal gear lowering capability, right front steering and brakes upon landing, #5 generator off, and bus powered by the other operating 3 generators. Number 6 engine: loss of the inboard spoiler/airbrake group.

At altitude we had windmill hydraulic pressure to lower the gear, our backup was the emergency switch which used opposite body hydraulics pressure. We also had windmill hydraulic pressure to operate the spoilers and airbrakes at altitude but not on approach for landing.

With two pilots, aircraft control was not sacrificed to get in the books to determine the proper procedures to safely recover the aircraft. As the pilot, I had my work to do.

Time to the high fix was one hour and 30 minutes. During this time I reviewed 32 pages with the crew. First, keep the aircraft flying, prevent the damage from incurring further damage; second, prepare data for a controllability check and data for landing with inoperative spoiler group, brakes and steering. So I had to get my ducks lined up. Upon initial contact with home station the instructor pilot on the ground wanted

to know what happened, what you did, what pages you have reviewed and all the data to be used to land. He is at ground speed zero with time to figure without distractions.

Once it was determined we had followed the tech order and accomplished the required checklist and were **mentally prepared** to land, we received the clearance.

Each emergency situation is different but the basic precept learned in UPT remains the same: Maintain aircraft control, analyze the situation and take proper actions, land as soon as **conditions** permit.

Flying in a crew aircraft lends an additional thought, keep the crew informed, use their knowledge and position to assist in handling the emergency. It really takes a crew effort to cover all the contingencies.

In this situation, I had time to decide, to decide the proper action, to analyze the situation and to be best prepared with the help of my crew. Mental preparation in any aircraft is the key to survival. **Fly smart. Fly safe.**

About the author. Capt Roberts graduated from UPT at Williams AFB in 1983. After completing B-52 CCTS, Capt Roberts was stationed at K. I. Sawyer AFB. He has been selected for the B-1B initial cadre at Ellsworth AFB.



PROFESSIONAL PERFORMERS

Flying Crew

Crew R-108 of the 384 AREFW, McConnell AFB, is SAC's Flying Crew of the Month. The crew, Capt Warren R. Cole, AC; 1Lt Chris C. Nichols, P; 1Lt Charles R. Mayberry, N; and AIC Thomas C. Day, BO, were flying a higher headquarters directed sortie in support of a Navy exercise, FLEETEX 1-87. The mission involved providing air refueling support to aircraft assigned to the USS Saratoga maneuvering approximately 350 miles off the coast of Puerto Rico. During simulated air-to-air action a Navy A-6 started rapidly losing fuel out of both wings. The Navy pilot stated he did not have the fuel to travel 200 miles to the carrier or Roosevelt Roads NAS, Puerto Rico. A Navy tanker, although in the immediate vicinity, was unable to transfer fuel after several attempts. Capt Cole and crew were orbiting and refueling over the carrier when Lt Nichols heard the problems the A-6 and



Navy tanker were having and offered to help. He contacted Navy GCI, AWACS and the crippled A-6 to expeditiously complete a successful rejoin. Additionally, Lt Mayberry's outstanding position awareness and timely heading adjustments allowed Capt Cole to "zero in" on the A-6 while maneuvering at high speed. AIC Day calmly and quickly made contact with the increasingly nervous fighter and

transferred the precious fuel. Capt Cole turned the tanker towards the Saratoga and refueled enroute. This allowed the A-6 to depart the tanker with the carrier in sight. As he departed, the Navy pilot said, "Boy, I never thought I would appreciate you boys in blue like I do today." Excellent airmanship, quick reaction and superb crew coordination saved this Navy aircraft and epitomizes the professional SAC crew.

Munitions Maintenance

TSgt Charles M. Mansfield, 28 BMW, Ellsworth AFB, is SAC's Munitions Airman of the Month. Currently assigned as a loading standardization crew team chief, TSgt Mansfield developed a comprehensive training syllabus that provided a firm basis to train all assigned load crews on OAS modified aircraft. His training schedule and instruction were so effectively applied that he qualified all crews within a two month period. TSgt Mansfield has been tasked several times to train individuals from other B-52

units as they received OAS modified aircraft. He also spearheaded an extensive training program recently to train personnel to load munitions on B-1B aircraft. Through his extensive research of technical orders and manuals, he identified deficiencies which he immediately submitted change requests to correct. One of the deficiencies he discovered was in the procedures used to ensure the 30-inch ejector rack for the B-1B was positively locked. Immediately he made all appropriate personnel throughout the command aware of the seriousness of the problem and initiated procedures and changes to prevent the possibility of the weapon inadvertently releasing from the 30-inch ejector rack.



Aircraft Maintenance

Sgt Kenneth R. Karasch is SAC's Maintenance Airman of the Month. Assigned to the 93d Maintenance Squadron, he has distinguished himself as the most productive, knowledgeable and dedicated NCO at Castle AFB. After crosstraining only two years ago, he supervises a five-member team for KC-135A and R model engine inspections. When quality assurance inspected his work on three separate aircraft, one was rated outstanding with zero defects, another was outstanding, and the third was rated excellent. He has a flawless Stan/Eval record. He volunteered to complete three engine removals over a holiday weekend, allowing the inspections to be completed on time. Sgt Karasch's efforts had a direct bearing on earning the 135 Aircraft Readiness Award for the wing. He is the primary certified R model engine operator and acts as the primary trainer for the FI08 engine. His efforts directly contributed to completing the second "R" model phase inspection ahead of time. Sgt Karasch used his expertise to readily identify over 25 discrepancies in the R model technical order system and has submitted the appropriate corrections.

Missile Maintenance

Sgt Stanley A. Cain, 351 Field Missile Maintenance Squadron, Whiteman AFB, Missouri, is SAC's ICBM Maintenance Airman of the Month. Serving as the PMT equipment mission support account primary custodian, Sgt Cain received error-free inspections by the SAC/IG and Command Management Equipment Team for his superior management. Sgt Cain initiated a change to periodic inspections (Dash-six technical order) workcards for gas mask filter replacement. This change, which provided for gas mask integrity, was immediately

approved. As the primary custodian of the PMT bench stock account, Sgt Cain coordinated with PMT teams to get additionally needed line items on bench stock and reorganized the entire storage area into an efficient and workable area. Sgt Cain has also developed a computerized inventory list for the PMT van equipment and supplies. This automated product allows for rapid inventory and stocking.

Missile Crew

The 44 SMW Crew R-092, 1Lt David Theroith, MCCC, and 2Lt James P. Fernandez, DMCCC, is SAC's Missile Crew of the Month.

The crew assumed alert at H-01 launch control center with responsibility for squadron command post functions, due to the command post being shut down for RIVET MILE maintenance. The crew was informed by maintenance teams working at H-05 and H-09 launch facilities that a severe snowstorm with heavy winds and sub zero temperatures would prevent travel to the support base. Crew R-092 was notified that the flight security officer and his vehicle were in a ditch. They immediately directed their flight security controller to maintain contact with the security officer to ensure his safety and informed the wing command post and maintenance job control of both situations. During this same time period, the crew coordinated the transfer of responsibility for one LCC's missiles to another LCC due to a computer malfunction. Shortly thereafter, another LCC was forced to transfer responsibility of its missiles to another LCC due to a similar computer malfunction. During this entire process, crew R-092 ensured that the squadron's emergency war order command control responsibilities were met as required by SAC directives. They also processed numerous security situations and LF power failures caused by the high winds and drifting snow. The crew directed a vehicle maintenance team to rescue the security officer and stranded teams. All were brought safely to H-01. Their

poise in directing rescue actions prevented possible injury and loss of life due to inclement weather.

Their sound professional judgment, high standards, and concern for safety minimized the potential for personnel injury or loss of life.



"Field Procedures"

Capt Wes E. Klett
3901 SMES

How many times have you heard "When we're in the trainer we'll do it this way?" Or, during a training session the instructor says, "We're training evaluation procedures here, not the real world." The double standard created through the use of "field procedures" or shortcuts can undercut leadership credibility. "Field procedures" are insidious and on numerous occasions I had to actively guard against developing this double standard. While I was able to avoid the temptation, others weren't quite as lucky.

A standard part of each pre-departure briefing is an explanation of recent safety deficiencies and mishaps. One day as we sat in pre-departure, we were being briefed on a fatality resulting when a vehicle rolled on a gravel road in the missile field. The death of this individual was due primarily to practicing "field procedures," similar to the ones mentioned before.

The mishap briefing brought another incident to mind where the members of a missile crew were "not doing what they should have been."

"Where are the keys to the truck?" George asked Bob after being relieved from alert. "They're upstairs with the FSC," Bob replied. "Oh, by the way, pump the brakes three or four times before you need to use them. There shouldn't be any problem though," he added as an afterthought. George had a big softball game that afternoon, and his deputy, Bill, was going out to dinner to celebrate his anniversary. Neither one of them wanted to be delayed by waiting for mobile maintenance, and since Bob did not make a big deal out of the brake problem, George and Bill decided to head for home. As the crew vehicle reached the end of the LCF access road, George tried the brakes, and they worked fine. They decided to take a route through the back roads since it was shorter, and by being off the beaten path, they could go faster. After driving for about 30 minutes over terrain that reminded George of a roller coaster ride, and the dose of caffeine from a Mountain Dew was gone, the just completed alert started taking its toll on his eyelids. They were approaching an intersection which was considered "dangerous" in the route folder due to its immediate drop following the crest of a hill.

"Holy Cow! Look out!" Bill yelled suddenly. A cow was standing in the middle of the road looking over its shoulder wondering what a crew vehicle was doing way out here. The same thought crossed George's mind. With plenty of room to stop before scoring a direct hit, he applied the brakes firmly. George felt like Fred Flintstone

as it seemed his foot went all the way to the road. He didn't have time to pump the brakes three or four times. George and Bill must have been living right, because they made it past the animal without even one hair in the side molding of the truck.

The safety briefing and recollection of that near miss caused me to reflect on the responsibilities of a missile combat crew commander. It is easy to look at the position of crew commander as merely an opportunity to sleep later on alert days since the commander normally doesn't pick up the alert vehicle, or as finally getting the good sleep shift on alert. Although these are two benefits of the job, they are insignificant when considering the responsibility inherent in the crew commander's position.

First, as a crew commander one must have demonstrated a sustained level of proficiency. This proficiency should be used to reinforce the knowledge the deputy received from initial qualification training. If the deputy has been on crew for a while, the opportunity exists to refine the concepts and techniques learned from others to fit the crew commander's style. Ensuring the proficiency of the deputy is only exceeded by the responsibility one has as a leader.

The responsibility and opportunity to provide an example to the younger officers and NCOs concerning professionalism and airmanship can be most enjoyable and rewarding, while also being most challenging. The cliché that "one lives in a glass house" is no more evident than when one commands. Regardless of the level of command, subordinates will watch not only to see how the leader operates in crisis situations, but more often in day-to-day conduct. One doesn't have the luxury of catering to the philosophy, "Do as I say, not as I do." The opportunity exists to impress the ideals and concepts of leadership which are important. Those individuals who don't take their position seriously and continuously complain and degrade the system are always vocal. If the conscientious commander doesn't voice what is right and demonstrate an air of professionalism, that individual allows the young officer or NCO to hear only a downside opinion.

That morning while driving to alert my thoughts returned to the two incidents that stimulated the philosophical thoughts. It was apparent that with the task of simply driving to and from alert an opportunity existed for two commanders to lead by example. One failed, the second was lucky. Their failure to impress upon their deputies the importance of merely following the approved routes and complying with the speed limits resulted in one crew member's death and a loss of credibility for the other. I looked at my deputy and renewed my commitment of providing a professional example at all times, feeling certain that I could prevent such an incident from happening to my crew.

SAC SAFETY SCREEN

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW AFR 127-2/SS1*.

341 SMW, Malmstrom Crew R-171: MCCC Capt Louis A Davis, DMCCC 2Lt Steven N Dorfman

308 SMW, Little Rock Crew S-202: MCCC Capt Jacques A Levesque, DMCCC 1Lt Dwayne R Turmelle, MSAT TSgt Phillip N Hays, MFT SSgt James E Cowart

92 AREFS, Fairchild Crew S-181: IP Capt Billy R Miles, P 1Lt Elizabeth I Futrell, IN Capt John C Shoemaker, IB SSgt Dean Oulela

92 AREFS, Fairchild Crew R-166: AC Capt Steven P Silver, P 1Lt Robert D Brazel, N 1Lt Craig C Venute, B A1C Ursula H Ward

9 AREFS, March Crew B-023: AC Capt Richard V Copley, P Lt Steven J Tasson, FE TSgt Ronald M Davis, BO TSgt Jeffrey McGirt

9 AREFS, March Crew C-033: AC Capt David A Razo, P Lt David P Pahos, FE TSgt Mark A Williams, BO SSgt Rodney H Bennett

22 AREFW, March Crew R-113: AC Capt Michael P O'Rourke, P 2Lt David E Johnson, N 1Lt David R Rue, IB Michael D Aldapa

22 AREFW, March Crew R-133: AC Capt Peter G Smith, P 1Lt Anthony P Suber, N 1Lt James G E Eastlund, IB SSgt Michael D Hawkins

328 BMS, Castle Crew IT-17: IP Capt Walter F Ledford, IRN Capt Carlos E Delgadillo, IEW Capt David K Swafford, IG SSgt Timothy J Nelson

328 BMS, Castle Crew IT-21: IP Capt Bryon D Woods, IRN Capt John R Durrer, IEW Capt Burton L VanDenburg, IG TSgt James J Galambos

924 AREFS, Castle Crew R-103: AC Capt Ronald L Warner, P 1Lt Richard K Houston, IN Capt Mario L Suarez, IB SSgt Jeffrey P Sargent

924 AREFS, Castle Crew R-108: IP Flt Lt Michael C Davidson, P 1Lt James A Ludden, P 2Lt Matthew E Morgan, N 2Lt Charles M Henderson, B A1C James D Thomas

93 AREFS, Castle Crew IT-19: IP Capt Mark J Meyers, IN Capt Michael D Elrod, IB TSgt Richard J Lusk

93 AREFS, Castle Crew IT-32: IP Capt Bruce E Hayes, IN Capt Michael L Stiers, IB SSgt Ronald L Combs

320 BMW, Mather Crew E-36: AC Maj Cameron K Green, P 1Lt Timothy M Wiesmann, RN Capt Jeffery E Enoch, N 1Lt Kelvin C Bowen, EW 1Lt William W Erbach Jr, G SSgt Glynn G Kovarik

320 BMW, Mather Crew S-23: AC Maj Logan R Kelly, P 1Lt Gilbert D Boyce, RN Capt Harold R Clary, N 1Lt Donald P Otoole, EW 1Lt Robert F Voelker, G SSgt Joseph G Martinovich

23 BMS, Minot Crew R-34: AC Capt Rueben Joswiak, P 1Lt Eric Rios, RN Capt Juan Gonzales, N 1Lt Clark Peterson, EWO 1Lt Raymond Alejandro, G Amn Eric McArthur

906 AREFS, Minot Crew R-113: AC Capt Richard Baldwin, P Lt Tony Martin, P Lt Ken Ulrich, N Lt Gene Marquez, BO Sgt Mark Ackerman

906 AREFS, Minot Crew R-120: AC Capt Robert Sauers, P Lt Rick Norris, P Lt Jeff Lamers, N Lt Bill Sargent, BO A1C Sterling Keller

906 AREFS, Minot Crew R-121: AC Capt Ray Smith, P Lt Charles Blackwell, N Lt Britta Trost-Rudman, BO TSgt Milton Barnwell

906 AREFS, Minot Crew R-122: AC Capt Ann Sparkman, P Lt Terence Lineham, N Lt Vic Kleiser, BO A1C Carol Sharp

28 BMW, Ellsworth Crew E-133 (KC-135R): AC Capt Jon W Murrie, P Capt Robert K Kuegman, N Capt Paul A Cannizzo, BO SSgt Joseph G Gedman

28 BMW, Ellsworth Crew R-115P (EC-135A): AC Capt Mark A Gillett, P 2Lt Luke J Disilvestro, N 1Lt Eric D Sillery, BO SSgt Mark W Sletten

28 BMW, Ellsworth Crew Z/37 (B-1B): IP Maj William J Fier, IP Maj Daniel R Horting, IOSO Maj Alan W Debban, IDSO Maj William M McGraw



We Remember,

General Ira Eaker, an Air Force founding father and air power advocate. His career was rich in major accomplishments and vision. From his inflight refueling endurance record and the first transcontinental instrument flight to daylight precision bombing, General Eaker kept the promise of air power alive. His vision of air power's potential has now become reality. Few individuals have had such a major impact on the Air Force. Reflecting on the Fortieth Anniversary of our service, we recognize how fortunate we are to live in the future he envisioned.

General Eaker, air pioneer and advocate, we salute you!